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Dear Editors,

Attached, please find my referee report for “The Cost of Financial Frictions for Life Insurers.”

This paper calculates cross sectional shadow cost of capital of life insurance companies during the financial crisis through exogenous variation in statutory reserves across different types of insurance policy. Empirical evidence suggests extraordinary pricing behavior of life insurance policy during the financial crisis i.e. insurance companies sold life policies with extremely low or negative margins despite lower interest rates. This paper pointed out that the statutory reserve regulation allows the companies to record far less than a dollar to cover future liabilities during December 2008. Therefore, companies with long-term deferred liabilities is more likely to record lower tend to recoded lower liabilities to improve accounting profit. This allows for calculation of shadow cost of capital embedding in each company.

This paper set up an optimal insurance policy model i.e. current and expected profit maximization subject to a capital dynamic constraint. Using first-order condition, the authors come up with the general insurance policy pricing equation, which includes the fundamental value (statutory reserve) adjusted for demand elasticity (Bertrand pricing formula) and for financial and market frictions. The model predicts that if the recorded reserves (exogenous variable) falls below the fundamental value times the threshold (ϕ), then the price of the policy should drop. This implies a straightforward non-linear model that allows the authors to recover the shadow value from the obtained pricing data. Moreover, the paper concludes that this extraordinary pricing behavior is caused by a downward shift in supply curve.

This paper provides a novel idea to estimate the shadow cost of capital for life insurance companies. However, the set up is quite simple and still need a more sophisticated econometric tool to conclude that a downward shift in supply curve causes a price fall. I would like to see the exogenous source of variation to be discussed explicitly. I would like to see the separation between different sources of friction and decomposition of ultimate shadow cost of capital. I also have some minor suggestions for further improvement. All the above, I would recommend revision and resubmission for this paper.

Best,

Isariya Suttakulpiboon

Referee report for “The Cost of Financial Frictions for Life Insurers.”

This paper calculates cross sectional shadow cost of capital of life insurance companies during the financial crisis through exogenous variation in statutory reserves across different types of insurance policy. Many empirical evidences suggest extraordinary pricing behavior of life insurance policy during the financial crisis i.e. insurance companies sold life policies with extremely low or negative margins despite lower interest rates. This paper pointed out that the statutory reserve regulation allows the companies to record far less than a dollar to cover future liabilities during December 2008. Therefore, companies with long-term deferred liabilities is more likely to record lower tend to recoded lower liabilities to improve accounting profit. This allows for calculation of shadow cost of capital embedding in each company.

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Main Comments:

1. The exogeneity of regulation change is not clearly explained in the paper. Since the authors built a model according to the change in statutory reserve requirement causes changes in insurance policy prices, the exogenous shock must be pointed but there is no clear explanation where the shock came from. Figures 1 and 2 show that the price margin started to drop below the lowest historical value somewhere around mid-2007 to early 2008. Figure 6 also shows that the recorded reserve value falls below the actuarial reserve value even before 2008 i.e. from 1999 to 2005. These empirical evidences correspond to the variation of shadow cost in figure 7, yet the exogenous shock is not explicitly discussed especially for the period 1999 – 2005. In other words, figure 7 is just a vertical flip of figure 6 since your model only allow you to do just that.
2. I appreciate the novel idea that allows market and financial frictions into insurance pricing. One thing that you could do to improve the model is to separate the shadow costs into two parts and allow for other exogenous shocks into the model i.e. financial market returns, for example. My hypothesis would be that during 1999-2005, the shadow cost of capital partially come from competition in the life insurance market while during 2008-2009, the variation in the shadow cost of capital significantly come from financial friction (exogenously determined by financial market return). Then figure 7 can be decomposed into 2 parts and we

can observe variation in the shadow cost and its components. This could reconcile the high shadow cost during 1999-2005 period.

Minor comments:

1. Equation 26. In lieu of using company-specific and policy-specific variables to estimate demand elasticity for insurance policies, cost-related variables should be used. It is more intuitive for the elasticity of demand to be related to the mark up on actuarially fair value according to Bertrand pricing formula. Moreover, the same set of variables is already used to model the shadow cost (λ). This aligns with Babbel (JF, 1985).
2. The explanation regarding downward shift in supply causes the price to fall is rather ad hoc. To strengthen the argument without reconstructing the model is to run the same regression shown in table at different time periods and controlled by various state variables such as interest rates or financial market returns.
3. Under product market friction section, you can cite Zanjani (JFE, 2002) which also embraces similar framework that consumer gain more utility by buying policy from an insurance company with higher capital.